MEMBRANE SEPARATION PROCESS FOR DAIRY WASTEWATER TREATMENT

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Abstract

In recent years, membrane separation processes in dairy industrial wastewater treatment offers several advantages: it runs with much less ecological footprint, more economical, more energy efficient, ease of operation and better possibilities of integration with other processes. Moreover it gives the possibility of water reuse However, these processes suffer from concentration polarization and membrane fouling which limit the membrane flux during filtration and negatively impact production efficiency with corresponding increases in energy consumption and is a major factor in determining the practical application of these techniques in water purification, wastewater treatment and desalination. Solving the problem of fouling through membrane modification by nano-materials has been attracting the attention of scientists. The aim of this work is to identify the factors affecting the membrane fouling during treatment of dairy wastewaters and present the recent development of research in this field.

Keywords: Membrane separation processes, dairy wastewater, fouling, nano-materials, membrane modification

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References

1.Y.R.Chang; Y.J.Lee; D.J.Lee; J. Taiwan Inst. Chem. Eng. (2018), doi:10.1016/j.jtice.2017.12.019

2. Y. W. Gong; H. X. Zhang; & X. N. Cheng; Water Science and Technology (2012), 915,919.

3. H. Lu; J. Wang; M. Stoller; T. Wang; Y. Bao; & H. Hao; Advances in Materials Science and Engineering (2016), 1,10.